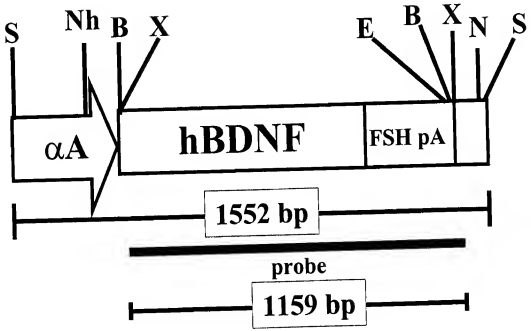

Figure 1

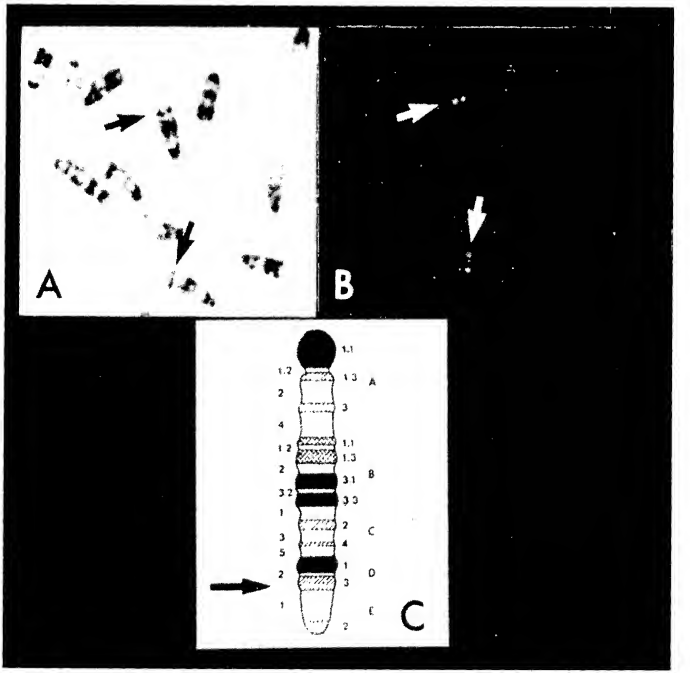

Figure 2

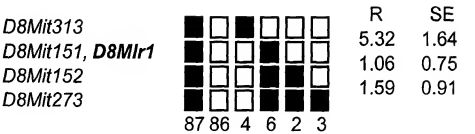
Jackson Chromosome 8
D8Mit313
D8Mit151, D8Mlr1
D8Mit152
D8Mit273
87 86 4 6 2 3
R SE
5.32 1.64
1.06 0.75
1.59 0.91

Figure 3

ACC#	species	exons represented	DNA homology	library
	human	40	90%	Soares_testis_
T47371	human	83	87%	Strgn. #937225
BF567477	rat	40	95%	UI-R-BO0
BE665278	bovine	84-87	83%	Marc 4bov
BF077884	pig	78-79	82%	Marc 2pig
BF078559	pig	66-67	83%	Marc 2pig
BB573629	mouse			adlt testis
AV278035	mouse	87	99%	adlt testis
BB015925	mouse	87	98%	adlt testis
BB555992	mouse	87	94%	prg ovary
BF042472	bovine	81-83	86%	placenta
BE935732	human			nervous
AW880607	human	31-34	83%	adlt ovary
AW880545	human	31-33	84%	adlt ovary
BE935729	human			nervous
BF361871	human	34-36	83%	nervous
BB664150	mouse	1 thru 5	99%	neonate lung
BB616892	mouse	75-78	98%	adult testis
BQ840375	mouse	87	100%	spermatocyte
BB641870	mouse	1and 3	98%	neonate cortex
BQ560006	mouse	20	100%	Mouse 7.4K
BB573629	mouse	47-48	96%	adult testis
BG771496	human	3 thru 7	85%	NIH_MGC_97
BF352620	human	5 thru 8	85%	HT0618
BG829246	human	55-59	81%	NIH_MGC_17
AU128584	human	3 thru 6	83%	NT2RP2
BF352665	human	4 thru 6 & 8	86%	HT0618
BF352642	human	5 thru 8 (additional)	86%	HT0618
AL556977	human	8 & 9	86%	LTI_FL012_TC1
BG999183	human	51 & 52	85%	HT1311
BQ776506	human	24	86%	HR85 islet
BM725878	human	38-40	87%	UI-E-EJ0
BM677992	human	39-40	87%	UI-E-EJ0
W26351	human	15-18	82%	adult retina
BG005773	human	22-24	82%	GN0240
AW901070	human	6 thru 8	86%	NN1010
BG928962	human	70-73	80%	Norm. Cartilage
AL705531	human	3 thru 5	84%	hlcc3
AA431373	human	17-19	80%	Soares_testis
AW292266	human	87		NCI_CGAP
AI809964	human	87	85%	mixed
AI693718	human	87	84%	mixed
AI693696	human	87	84%	mixed
AI564238	human	87	84%	NCI_CGAP_Ut1
AA488706	human	15-16	87%	Strgn. #937210
AI824393	human	87	84%	NCI_CGAP_Ut1
AI829538	human	87	84%	NCI_CGAP_Ut1
BF376220	human	4 thru 5	83%	TN0036
BQ448683	human	15 thru 16	86%	NCI_CGAP_Ct1
N50787	human	87	83%	2NbHMSP
BQ776830	human	19-24	83%	HR85 islet
AW896634	human	8 thru 9	85%	NN0050
BE549744	human	24	88%	NCI_CGAP_Lu24
AI689735	human	24	88%	NCI_CGAP_Lu24
BG992430	human	73-76		HT0999

Figure 4A

ACC#	species	exons represented	DNA homology	library
AL703616	human	48-51	79%	hlcc3
BE935732	human	85	93%	NN0044
BE935729	human	85	93%	NN0044
AL712790	human	7	83%	hlcc3
BI560655	human	67-68	83%	NIH_MGC_97
BQ352231	human	7 thru 8	90%	HT0618
AW893199	human	15	89%	NN0009
BF093325	human	80-81	84%	TN0136
BF402637	rat	87	89%	UI-R-CA0
BF199199	pig	87	81%	MARC 2PIG
BF199193	pig	87	89%	MARC 2PIG

Figure 4B

Human Hydin cDNA (SEQ ID NO: 14)

AGCTCGGGCGGCGCATGGAGAGTGCGGGCGGCTTCAAGCTGGGTATGGAGCCCCTCAGCGGC
GGCGGGGTCTGTGAGTTGGACGCGGGGTCTTGGCGGGGAATGGAGGTAGAATAAACGTGGGA
CCCGGAGTGCACCAAGGTGAGAAAAAAAAAATTACTAAAAATGACAAGTAGAAGACTTGAGGA
GTCCATGGGGGCTGTTCAGATGGGATTGGTCAATATGTTCAAAGGATTTCAAAGCAAGGTTT
TGCCACCCCTGAGTCCAAAGGTGGTTACAGAAGAAGAAGTAAACCGAATGCTTACACCCTCA
GAGTTCCTGAAGGAAATGTCCCTGACCACCGAGCAGAGACTGGCAAAAACACGTTTGATGTG
CCGACCACAGATCATCGAACTCTTAGATATGGGGGAAACAACACATCAGAAGTTTTCAGGAA
TTGACCTGGATCAGGCATTATTCCAGCCCTTTCCATCAGAAATTATATTTCAGAACTACACT
CCCTGTGAAGTCTATGAAGTTCCACTGATTTTGAGGAACAATGACAAAATTCCAAGGTTGGT
GAAAGTTGTGGAAGAAAGTTCGCCTTACTTTAAAGTAATCAGCCCCAAAGATATTGGCCACA
AAGTGGCTCCTGGAGTGCCTTCCATATTCCGAATCCTCTTTACTCCAGAGGAGAACAAGGAT
TACGCCCATACGTTGACCTGTGTTACTGAAAGAGAAAAGTTTATTGTACCCATCAAAGCTAG
AGGGGCACGAGCCATTCTCGATTTTCCTGACAAGCTGAATTTTTCCACTTGTCCTGTCAAAT
ACAGCACCCAGAAGATTCTGCTGGTACGAAACATTGGCAACAAAAATGCTGTATTTCACATC
AAAACTTGTAGGCCTTTCTCTATAGAACCAGCTATTGGAACTCTTAATGTGGGAGAGTCCAT
GCAACTGGAAGTGGAGTTTGAGCCACAGAGTGTGGGCGATCACAGTGGAAGACTTATCGTGT
GTTATGACACAGGTGAAAAGGTGTTTGTATCTCTCTATGGAGCTGCCATAGACATGAATATA
AGGCTGGATAAGAATTCCTTGACCATCGAGAAAACCTACATATCTCTGGCCAATCAGCGAAC
TATAACCATTCACAATCGCAGTAATATCATTGCCCATTTCCTGTGGAAGGTATTTGCTACCC
AGCAAGAAGAGGACAGAGAAAAATATAGGGCCTGTGATGATCTGATCAAAGAGGAGAAGGAT
GAGACTGATGAGTTTTTTGAAGAGTGCATTACTGATCCTTTACTCCGAGAACATCTTTCTGT
TCTGTCCCGAACCTTTGCGAATCAAAGGAGGCTGGTGCAGGGAGACAGCAAACTGTTCTTCA
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ACCGTGTACTTTAACCCACTAGAAGCCAAGCTCTATCAACAGACCATTTACTGCGACATTTT
AGGCCGAGAAATCCGTCTGCCCCTCCGAATCAAAGGGGAAGGCATGGGACCTAAGATTCACT
TCAACTTTGAATTGCTGGATATTGGGAAAGTTTTCACTGGATCTGCACATTGTTATGAGGCG
ATACTGTACAACAAAGACAGCATCGATGCTCTCTTCAACATGACCCCTCCAACTTCAGCTTT
GGGGGCCTGCTTTGTTTTCAGTCCCAAGGAAGGCATCATTGAACCAAGTGGAGTCCAAGCTA
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AATGGGTCACCTGAGCCTGTGAAACTGACCATTAGAGGCTGTGTCATTGGACCTACCTTCCA
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GTTCCCTCAATAATACCTCTTTGATCCCCATGACTTACAAACTGCGTATCCCTGGGGATGGC
CTTGGCCATAAAAGCATTTCATATTGTGAGCAGCATGTGGACTACAAAAGACCGTCTTGGAC
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TTCCCGCATTTTTCCAGGCACACATGGCACACAAAAAATCCCTTTGGACGATTGAACCCAAT
GAAGGCATGGTTCCTCCAGAAACTGATGTTCAACTGGCCAACTGACCGCCAACCTGAATGACAC
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TCGGATCCAACAGTTGTTCTGGATGAATGATAGCTTCCGACCCCAGGCCAAGCTGAGTAAGA
AGGGCCGGGTTAAGAAGGGACATGCTCATGTCCAACCCCAGCCCAGTGGCTCTCAGGAGCCC

Figure 5A

AGGGATCCACAGAGCCCCGTGTTTCATCTCCACCCCGCCAGCATGGAGCTGTACCCAGGCCA
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TGCCCGTGAACTTGTTGCTGTCAACATCTGGACCCTTCTTTATATGTGAGACTGATAAATCC
CTGCTGCCGGCAACTCCTGAGCCTATTAAACTGGAAATTGATGAAGAAAAAAACCTGCTGAT
CAAGTTTGACCCTTCCTACAGAAACGATCTGAACAACTGGGTGGCAGAAGAAATTCTAGCAA
TTAAGTATGTGGAACACCCTCAGATAGACAGCCTGGACCTGCGCGGAGAAGTGCATTACCCC
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TCGCTACGTTACCATCACCAACTGCAGTCCGTTGGTTGTGAAGTTTCGCTGGTTCTTCTTGG
TGAATGATGAGGAAAATCAGATAAGGTTTGTGACATTGCCAAAGAAGCCCTACAGTGCCCCA
CTGTCCCAGATGGAGTCCATCCCAGCAACCTCAGAGGCTGCCAGCCCACCAGCAATCCTAGT
TACAGTAGAGTCCCCCGAGATGGATTTAAATGATTTTGTTAAGACTGTCCTTGTGGATGAAG
ATGCCAGGCCTGAAGAAAAAGAACTAAGAAAAACAAAAGCTTCCAGTGTGATCTCAGATGAA
ATAAAAATTAGCTCTACTGAAATAGAAAGAATATACTCAAGCCAGAGCCAGGTGGAGGATCA
GGAATCCCTACAGACCTGTGAACAGAATGAGATGCTTTCCATTGGGATAGAAGAAGTGTTTG
ATATTTTGCCCCCTGTTTGGAGTGTTGCAGCCACACAGTAGCCACCAAATATCGTTCACCTTC
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CCCTGGAGTGCCACTAATCCTGCCTGTGTCTGGCTTTATCAGTTCACATCAAGAGCAGGTAT
TAAAAGTTTACTACCTACCTGGAGTACCTGAGGTCTTTAAAAGGAGTTTCCAGATACAGATC
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GACTTTGGCTACATCATCCTTGGCGAAGTCCGAACCCACATCATCAAGATCATCAACACCAG
TCACTTTCCAGTGTCATTCCATGCAGACAAGCGTGTCCTTCATGAGACAGGATTCAGTACTG
AGCTAGATCGTGTAAAGAATCTGCCTCATTGTGAAACGGAAATATTTGAAGTGAGATTTGAC
CCACAGGGGGCCAATCTTCCTGTTGGAAGCAAAGAAGTCATTCTGCCCATCAAGGTGGTTGG
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GCTTCAGAGCATTGACAGCCACTCCATGGAGGAAGTTGGAGAGGTGGAAAACAACCCAGTGA
GCAAAGCAATCGCTCGCCACCTGGGCATTGACATTTCTGCAGAAGGCCGCCTGGCCAAGAAC

Figure 5B

CGGAAAGGCATCGCCATTATCATTCACGGGACACCCTTGTCAGGAAAGTCAGCCAATGCCGT
TAGCGTGGCCAAGTACTACAACGCAGCCTGCCTGAGCATCGACTCCATTGTGCTGGAAGCTG
TGGCCAACAGCAACAACATCCCAGGGATCCGGGCCTGTGAGCTCTGCATCAGGGCTGCCATA
GAGCAGTCCATGAAGGAAGGAGAGGAGGCTGCCCAGGAGGCAGCTGTGGGTCAAAACGTCAT
AGGGCAAGGACGACTGAGCACTGACACTTTGGGCAAGTTAGCCTCCGAGATGACTCTGGTGG
CCCCAGAAATTAAACCTGGAAAGAGTGTTCGTGGGAGCGTGGTGATCACCAAAAGCAAGGCA
GACAGCCATGGCTCCGGGTCACAGAAGCAGCATCACTCACACCAGTCTGAAACACCACAGAT
TTCCTCCAGCCCTCTCCCCCCGGGGCCCATCCACCGCTGGCTCAGTGTTAGTCCCAGTGTCG
GAGGCGAGACCGGGCTGATGAGCTGTGTGCTCCCGGATGAACTTCTCGTGCAGATCCTGGCA
GAGCGGATACAGCTGAGTGACTGCTACCGAGGAGTGGTGTTTGATGGCCTCGACACTCTCTT
TGCTCGGAATGCTGCAGCCGCCCTCCTCTGCCTGCTGAAGGCCATTGGCAGCCGGGAGCATA
TATACATTCTCAACATGGCCCAGGATTACGCAGCCATGAAGGCCCGGGAGAAAGCCAAAAAG
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GGATGAGGAAGAATATGATGCCCTGACTGAGGAGGAGAAACTCACATTCGATCGGGGGATTC
AGCAGGCGCTCCGCGAGCGGAAGAAGAGGGAGCAGGAGAGGCTGGCAAAGGAAATGCAAGAA
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TGTCAGCATGCATGGGCTTCCTCTTGTCCAGGACCAAGAGGACAGTGAAGGGGACAACTCAA
AGGACCCCGACAAGCAACTGGCCCCGAAGTTTAAGACCTATGAATTGACACTGAAGGATGTC
CAGAACATCCTCATGTACTGGGACCGGAAGCAAGGAGTCCAGCTGCCTCCTGCAGGGATGGA
GGAAGCGCCCCATGAGCCCGACGACCAGCGCCAGGTCCCCTTGGGTGGGCGCAGGGGCCGCA
AGGACCGGGAGAGAGAGCGCCTGGAGAAGGAGCGCACGGAGAAGGAGCGCCTGGAGAGGGAG
AAGGCGGAGCGGGAGCGCCTGGAGAAGCTGCGAGCCCTGGAGGAGCGGAGCGACTGGGAGGG
GGAAGGGGAGGAGGACCACGAAGGGAAGAAGGAGAAGGACCTGGGCGTACCCTTCCTAGACA
TCCAGACACCAGACTTTGAAGGCTTGAGCTGGAAGCAGGCCCTAGAGAGCGACAAGCTTCCC
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ATTTCCCAGCTGTCAGATACAGACCTGGACAACTTCAACGGGCAGCACTCCCAGGAGAAATT
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ACTTCTCTTCTGATGAGTTCGGGAACTTTGACCAAACCTTTAACTTTGAGATCCTAGGAACT
TGCTGCCAGTACCAGCTCTACTGCCGAGGCATCTGCACTTACCCATACATTTGCCAAGACCC
AAAAGTGGTATTTCCTCAGCGGAAGATGGACATGAAGACAAATGAGGTCATCTTTAAGAAGT
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TACAAGTCATCCTTATTCCCAGGCAACATGGAGACGCTAACAATCCTGAACACTTCCTTAAT
GGTGGTGGAGGCATCCTTCTATTTTCAGAATGATGTCAAAGCAAACACGTACTTCCTGGAAC
CCAACACCATGGTCCTGAAACCCAATGAGAAGCAGATATTAAACGTATGGGCCTACCCTACT
TCAGTTGGTGTCTTTGAAGACAGCATTGTCTGCTGCATCAATGACAACCCAGAGCCAGCCAT
CTTCCAATTAAGCTGCCAGGGGATCCGCCCGGAACTAGAGCTGGAACCCAGGCAATTACATT
TTGACCGGCTCTTGCTGCACAGACAGGAATCCAGGGTAGTTCTTCTCCGCAATGTCACGCTC
CTGCCTGTGGCCTGGCGGATCACCAGCCTGGAGCACTTGGGTGATGATTTCACTGTATCCCT
GATGCAGGGGACCATCCCCCCTGAGGCTGAGTACGGCCTGCACCTGTACTTTCAGCCCACCA
AGCCTGTCAACATCAAGAAGGCTATTCGGTTGGAGGTTTTAGATGCAGAAAATCTTCTTGGT
GTTGTTCAGATTGAAAATATCATGGTCTTTGCAGAGGCATACGACATCGCCTTGGACATCAC
CTTCCCCAAAGGAGCTGAAGGGGGACTGGATTTTGGGATTGTCAGGGTCACAGAGGAGGCGA
AGCAGCCCCTGCAATTGAAGAACCGTGGGAAATATGAGATCGCGTTCAGCTTTTCCGTGGAC

Figure 5C

TCTGTAGGGATTTCAACACCTAATATAAATTCCATGATCTCAGTCCAACCCAAAAAGGGTTC
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AGATTGAGCACCAGCCTGTTCTGCGCTGTCAGATTATTGAGCCCAATATTTCAGAAGGAGGT
GAGATCATTGCCAGCATCCCAATTAAGTTTTCCGCGAATGCAGTATATTCCAAATACAACAT
CACCCCCTCCTCTGTCATCAACTTTGGAGCTTTGATCTGTGGCACTCGTAAAAGCACCACCT
TCACCATAGAAAATCAAGGTGTTACTGACTTCAAGTTCGCCCTTTATAAGCTGACAGGGGAG
AGCCCCATTCATCAAAAGAAAGCAGCCAGCCACGTCAGACATGCAAGATCCCGAGAAAGTGA
GAGCTTCTACAAAACTGGCTCTTCCAGAGCAGCCAAGTTCTCTGACACGATTCAGAAAGAAG
TAACCACCACAGGCCAGGCCCGCTTCGCCCATGGCATGTTCACCGTGTACCCTGGGTTTGGC
TCCATTCCTTCCGGAGGACAGCAGGTCATCAACGTTGACTGTGTGGCTGACGCCATGGGAAA
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GAGCGGGGGGCTGTTCGTCGAGGATGAGAACAAGTTCATCTTCTGCAATGTCCTGGTGGGCC
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GGTGGGAGAGGGCTATGAGGATGACATCACCTTGGACAACATCCATGGACTGGTGGCCCCCA
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CTGTTTCAGCTACAATTGCTTTCTCCCCACAGATGGGCCACCTCCACCCTGGGTGTGCCAAG
GACATAGTGGTGACCATGAAGTCAGATGTACCCATCAACCTAAAGAATATGCGGATCAGGTG
CAAGCTCTCCAGGATTATGTTTCAGCTCCCTGCAGACCAGGTCCCCGACTGGGATGACCGCA
TGCACACAGTCAAGTGGGTGGACGTACCCAGAAACATGCCTGGGACTTTCACTACAAAACGA
AAAGTGATAGAGACGGATCCGGAACCTGCTCACTCAGTACTAGAAGAAAACTACCAAGAACT
GCAGCTTCAAATCAGTGCCAATGTGGATTTCGCTTCATACCATTGCCAAGCAAGAGATGTGC
GCTTTAAGGAAACCTTGGTTTACCAGACCCGAGTGTTTGAGTTCGATGTGATTAATTCAGGA
CGTGTCCAGCTGGAATTCAGCTGGGTCTCAGAAGATACCTCAAAGGCAGTCAGCTTTGCAAA
ACCAGATCACCAAGGTTCAGCTCAAAAAGATCAGCTTAGTCAGGGCACGATGCATACAGGCA
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GCAAGGTCCGGTCCTGGTAGCAAAAGGGCGGAGCACCTTGCCCATCTGCCATTTTGATCTGA
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GCTCTGGATCCAAACACCCGGGTGATTGAGTTCACCACTGTGGGCATAGGAGGGAAGAATCT
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TCGTGTTCCAGTTCACACCTTTCCATCTGGGCATCACTGAGTCATCATGGACCTTCCTAATTT
CCCGAGCACAACATCACAATCGTGTTCCAGTTCACACCTTTCCATCTGGGCATCACTGAGTC
ATCATGGACCTTCCTAATTCCCGAGCACAACATCACAGTCCCTTTCCTGCTGGTAGGCAAAA
CTACCGAACCTCTCATCTCTCTGAACAAGTCACACCTCAACTTCAGCTCTCTCCTCATTGGC
AGAGAAGCCAGGGAGACTGTGCAGATCATTAACAAGGAGGAGCAGGGGTTCGATTTTTCCTT
CCAGGACAACTCCCGCTATTCTGAAGGTTTCAGCAACAGCCTGCTTGTATGTCCCATGGAAG

Figure 5D

GCTGGATCCCACCACTGTCCAGGTTCCCAATTGATATTTTCTTCACACCAAAGCAGGAAGGA
GATGTGAACTTTAATTTGATCTGCAATGTGGAAAAGAAAGTCCACCCTGTGACATTAAATGT
CAAGGCCGAGGGCTACACTATGAATGTGGAGATCAAGTGCAAGGACAGGACAGGCTCCATCA
CTCTGTTGACTCCCAACCAGACTAACATCATCAACTTCTATGAGGTGGAGTTAAATGAATGT
GTCCAGTGTGAATTCAACTTTATCAACACTGGAAAGTTCACCTTCAGCTTCCAGGCACAGCT
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CTGGAACTCATAATCAAGATCAGCCATGGTCCAACATTTATGTGCAACATCTCAGGCTGTGC
TGTGAGCCCGGCTATCCATTTCTCCTTCACCAGCTACAACTTTGGGACCTGCTTTATCTATC
AAGCTGGGATGCCCCCATACAAACAAACCCTGGTAATTACCAACAAGGAAGAAACACCTATG
AGCATAGATTGTCTGTACACCAACACCACTCACCTCGAGGTGAACTCCCGTGTTGATGTGGT
AAAGCCAGGAAACACATTGGAGATTCCAATAACTTTTTATCCTCGAGAAAGTATCAACTATC
AAGAACTCATTCCCTTTGAAATCAATGGGCTCTCACAACAAACAGTCGAAATCAAAGGGAAG
GGTACCAAAATGAAGATTTTAGTCCTAGATCCAGCCAACAGGATTGTGAAGTTGGGAGCTGT
CCTACCAGGGCAGGTTGTGAAAAGAACAGTTTCCATCATGAACAACAGCCTGGCCCAGCTCA
CATTTAATCAGTCCATTCTGTTCACAATTCCAGAACTCCAGGAACCCAAGGTCCTTACCCTG
GCGCCCTTCCACAACATCACACTGAAGCCCAAAGAAGTCTGTAAACTGGAAGTCATCTTTGC
CCCGAAGAAGCGTGTCCCTCCCTTCTCTGAGGAAGTGTTCATGGAATGCATGGGGCTCCTGC
GCCCCCTCTTCCTCCTTAGCGGCTGCTGCCAGGCCCTGGAGATCTCACTGGACCAGGAACAT
ATTCCCTTTGGACCCGTGGTGTATCAGACGCAAGCCACACGTCGCATCCTCATGATGAACAC
AGGCGATGTGGGTGCAAGGTTTAAATGGGACATCAAAAAATTTGAGCCTCATTTCTCCATTA
GCCCAGAAGAAGGCTATATTACCTCAGGCATGGAGGTTTCTTTTGAAGTGACCTACCATCCC
ACCGAGGTGGGAAAGGAGAGCCTTTGTAAAAACATTCTCTGCTACATCCAGGGAGGCAGTCC
TCTGAGTCTAACCCTGTCTGGAGTCTGCGTGGGACCACCTGCGGTAAAAGAGGTAGTGAATT
TCACGTGCCAGGTGCGCTCCAAGCACACGCAGACCATCCTGCTGTCAAACCGCACCAACCAG
ACCTGGAATCTGCACCCCATCTTTGAGGGCGAGCACTGGGAGGGGCCTGAGTTCATCACCCT
GGAGGCCCACCAGCAAAACAAGCCCTATGAGATCACCTACAGGCCCCGCACCATGAACTTGG
AGAACCGCAAGCACCAGGGCACCCTCTTCTTCCCCCTCCCAGATGGGACCGGCTGGCTGTAT
GCTCTGCATGGGACTTCTGAGCTCCCCAAAGCTGTAGCCAATATCTATCGTGAAGTGCCATG
TAAGACCCCCTACACTGAGCTTCTGCCAATCACCAACTGGCTGAACAAGCCCCAGAGATTCC
GGGTCATCGTGGAAATACTGAAACCAGAGAAGCCGGACCTAAGCATCACTATGAAGGGCCTT
GATTACATTGATGTACTGTCTGGCTCTAAGAAAGACTACAAGCTGAACTTCTTTTCCCACAA
GGAGGGAACGTACGCTGCAAAGGTGATCTTCCGAAACGAGGTGACAAATGAGTTCTTGTACT
ACAATGTGAGTTTCAGGGTCATCCCTTCAGGCATCATCAAAACCATCGAGATGGTGACCCCA
GTCCGGCAAGTTGCGTCAGCCTCCATCAAGTTGGAGAACCCTCTGCCCTACTCGGTGACCTT
CTCCACGGAATGCCGGATGCCCGACATCGCCCTGCCCTCCCAGTTTGTGGTGCCTGCCAACT
CCGAGGGCACGTTCTCATTTGAATTTCAGCCCCTGAAAGCTGGAGAAACCTTCGGAAGACTA
ACTTTGCACAACACTGACTTGGGTTACTACCAATATGAGCTCTATCTGAAAGCCACGCCAGC
ACTTCCGGAAAAGCCTGTTCACTTCCAGACTGTCCTTGGCAGCAGCCAAATCATCCTTGTGA
AGTTCATCAATTACACACGGCAGAGGACAGAATACTACTGCAGGACCGACTGTACAGACTTC
CACGCAGAAAAACTCATTAATGCAGCCCCAGGAGGCCAGGGAGGCACTGAAGCCAGTGTGGA
AGTCTTATTCGAGCCCAGCCACCTGGGTGAGACCAAGGGCATCCTGATCCTATCATCGCTCG
CAGGTGGAGAGTATATCATCCCCCTCTTTGGAATGGCTCTGCCTCCCAAGCCCCAAGGTCCC
TTCTCGATCCGAGCCGGGTACAGCATAATCATCCCCTTCAAGAATGTCTTCTATCACATGGT
GACCTTCTCCATCATCGTGGATAACCCAGCCTTCACCATTCGCGCTGGAGAGTCTGTGCGGC
CCAAGAAGATCAACAACATCACAGTCTCCTTTGAAGGAAACCCATCTGGCAGCAAAACCCCC
ATCACCACCAAGCTGACTGTGAGCTGCCCTCCTGGTGAAGGGAGTGAGACTGGAGTTAAATG
GGTTTATTATCTGAAGGGGATCACCCTTTAGTGGTAACCAGGGTTACCTGTATCAACCAAAA
GCTATGCATTGTCTTAGCCTGAAAAAGAATAGAGAAAACAATAAGAATTCTAAAGGAACTGT
TTTTATTCTTCTCATACAATTATAGGGCAGTTATTTCCCTATTATGTGTTTTCCAAATATAG
ATATGAAATATCTATTCCATATTAAACATTATAACTACACACAA

Figure 5E

Human Hydin Protein(SEQ ID NO:15)

MGAVQMGLVNMFKGFQSKVLPPLSPKVVTEEEVNRMLTPSEFLKEMSLTTEQRLAKTRLMCR
PQIIELLDMGETTHQKFSGIDLDQALFQPFPSEIIFQNYTPCEVEYVEPLILRNNDKIPRLVK
VVEESSPYFKVISPKDIGHKVAPGVPSIFRILFTPEENKDYAHTLTCVTEREKFIVPIKARG
ARAILDFPDKLNFSTCPVKYSTQKILLVRNIGNKNAVPHIKTCRPFSIEPAIGTLNVGESMQ
LEVEFEPQSVGDHSGRLIVCYDTGEKVFVSLYGAAIDMNIRLDKNSLTIEKTYISLANQRTI
TIHNRSNIIAHFLWKVFATQQEEDREKYRACDDLIKEEKDETDEFFEECITDPLLREHLSVL
SRTFANQRRLVQGDSKLFFNNVFTVEPLEGDVWPNSSAEITVYFNPLEAKLYQQTIYCDILG
REIRLPLRIKGEGMGPKIHFNFELLDIGKVFTGSAHCYEAILYNKDSIDALFNMTPPTSALG
ACFVFSPKEGIIEPSGVQAIQISFSSTIGNFEEEFLVNVNGSPEPVKLTIRGCVIGPTFHF
NVPALHFGDVSFGFPHTLICSLNNTSLIPMTYKLRIPGDGLGHKSISYCEQHVDYKRPSWTK
EEISSMKPKEFTISPDCGTIRPQGFAAIRVTLCSNTVQKYELALVVDVEGIGEEVLALLIAA
RCVVPALHLVNTEVDFGHCFLKYPYEKTLQLADQDDLPGFYEVQPQVCEEVPTVLFSSPTPS
GVISPSSTIHIPLVLETQVTGEHRSTVYISIFGSQDPPLVCHLKSAGEGPVIYVHPNQVDFG
NIYVLKDSSRILNLCNQSFIPAFFQAHMAHKKSLWTIEPNEGMVPPETDVQLALTANLNDTL
TFKDCVILDIENSSTYRIPVQASGTGSTIVSDKPFAPELNLGAHFSLDTHYYHFKLINKGRR
IQQLFWMNDSFRPQAKLSKKGRVKKGHAHVQPQPSGSQEPRDPQSPVFHLHPASMELYPGQA
IDVILEGYSATPRIVKEKLVCHAIIGAQKGKSLVMAVNITCEFVAPLIQLSTKQLIYRLEKK
PNSILKPDYQPLAVKNISTLPVNLLLSTSGPFFICETDKSLLPATPEPIKLEIDEEKNLLIK
FDPSYRNDLNNWVAEEILAIKYVEHPQIDSLDLRGEVHYPNLSFETKELDFGCILNDTELIR
YVTITNCSPLVVKFRWFFLVNDEENQIRFVTLPKKPYSAPLSQMESIPATSEAASPPAILVT
VESPEMDLNDFVKTVLVDEDARPEEKELRKTKASSVISDEIKISSTEIERIYSSQSQVEDQE
SLQTCEQNEMLSIGIEEVFDILPLFGVLQPHSSHQISFTFYGHANIIAQAKALCEVEEGPTY
EITLKGEASLVNYSFDTKDIHYGLQLFDHVTEREITLTNMGKVGFEFKVLTDHQSSPDNLLP
GVPLILPVSGFISSHQEQVLKVYYLPGVPEVFKRSFQIQIAHLDPENITLSGEGIFPQICLD
LPRNLTANEKYEMFLNQARKNTDKEYNKCEMLDHFDVITEEVPEDEPAEVSAHLQMEVERLI
VQSYVLEHQKTTTPDPMDDPCFSHRSRRKLAKIQLPEYILDFGYIILGEVRTHIIKIINTSH
FPVSPHADKRVLHETGFSTELDRVKNLPHCETEIFEVRFDPQGANLPVGSKEVILPIKVVGG
PTVHICLQAKVTIPTMTLSRGKVDFATIQCGQCLVETIQLSNHLQVPCEWFVQSQKPVDKLE
KHMPKYLRQKLRAELKPKTRIFEIQPISGVLDPGEKSNVQVKFMPKEEKFYSQTLVFQIAQS
AQKLTLLARGQGLEPRLEFSPSVLDLGPLLLCAPGDEAEVIVKNPCNFPIEFYSLEFDQQYL
IEEKILRKLKGYDSYNTLLLPPHNPGEKLPPELYEYFKEIKKSKEEQMRAKYLENLAQEN
EEEDITSSDQGTSNSTKRTSLSRGISVTSNLEEWHALLVESKTYLEEEEDEESLEKIIFQTD
KLQSIDSHSMEEVGEVENNPVSKAIARHLGIDISAEGRLAKNRKGIAIIIHGTPLSGKSANA
VSVAKYYNAACLSIDSIVLEAVANSNNIPGIRACELCIRAAIEQSMKEGEEAAQEAAVGQNV
IGQGRLSTDTLGKLASEMTLVAPEIKPGKSVRGSVVITKSKADSHGSGSQKQHHSHQSETPQ
ISSSPLPPGPIHRWLSVSPSVGGETGLMSCVLPDELLVQILAERIQLSDCYRGVVFDGLDTL
FARNAAAALLCLLKAIGSREHIYILNMAQDYAAMKAREKAKKEQEERKHKGALEKEKERLQN
MDEEEYDALTEEEKLTFDRGIQQALRERKKREQERLAKEMQEKKLQQELERQKEEDELKRRV
KKGKQGPIKEEPPMKKSQAANKQVPPLTKVDVKMETIERKISVREQTMSEKEELNKKKRNMG
DVSMHGLPLVQDQEDSEGDNSKDPDKQLAPKFKTYELTLKDVQNILMYWDRKQGVQLPPAGM
EEAPHEPDDQRQVPLGGRRGRKDRERERLEKERTEKERLEREKAERERLEKLRALEERSDWE
GEGEEDHEGKKEKDLGVPFLDIQTPDFEGLSWKQALESDKLPKGEQILDILGLGASGPPIPP
PALFSIVSYPVKRPPLTMTDDLEHFVFVIPPSEDISLDEKKEMEIESDFLATTNTTKAQEEQ
TSSSKGGKQKMKEKIDQVFEIQKDKRHMALNRKVLSGEPAGTISQLSDTDLDNFNGQHSQEK
FTRLNHFRWIVPANGEVTLQVHFSSDEFGNFDQTFNFEILGTCCQYQLYCRGICTYPYICQD
PKVVFPQRKMDMKTNEVIFKKYVMSTETYYFGPLLCGKSRDKYKSSLFPGNMETLTILNTSL
MVVEASFYFQNDVKANTYFLEPNTMVLKPNEKQILNVWAYPTSVGVFEDSIVCCINDNPEPA
IFQLSCQGIRPELELEPRQLHFDRLLLHRQESRVVLLRNVTLLPVAWRITSLEHLGDDFTVS
LMQGTIPPEAEYGLHLYFQPTKPVNIKKAIRLEVLDAENLLGVVQIENIMVFAEAYDIALDI
TFPKGAEGGLDFGIVRVTEEAKQPLQLKNRGKYEIAFSFSVDSVGISTPNINSMISVQPKKG

Figure 6A

SLTPTEKPTNVQVFFHAKKEVKIEHQPVLRCQIIEPNISEGGEIIASIPIKFSANAVYSKYN
ITPSSVINFGALICGTRKSTTFTIENQGVTDFKFALYKLTGESPIHQKKAASHVRHARSRES
ESFYKTGSSRAAKFSDTIQKEVTTTGQARFAHGMFTVYPGFGSIPSGGQQVINVDCVADAMG
KCEEFIAIDISGRDPAVHPAGILYTLLAEACLPAFVTENNALIFEEHQICTSANLHHILQTI
ESGGLFVEDENKFIFCNVLVGRQAKARFKISNVGKITCDVNIVVRPISNKPFARIVDIFEVE
PSKMCIASHSHAFATVSFTPQIMQNYQCIFEATLDGLPSTLAKSRGLVFDIAGEGNLPRVTV
VRPVLHNQYGNPLLLFKRLLLGHSEKLPLILKNNGVLPAQLHVDLQDELGVFSLKGRPTTAY
IYITEENKPHVKAKKAHTASLVVSPGDTAEFDVVFHSQKVGRMRGIIHLSVINNQYEETSIH
MVGEGYEDDITLDNIHGLVAPTSQEDISISEFTEIIEDNDMEDLVAAALVDHIQFGDCHIGH
SYNASFTVTNHSQVNLIRFEWPVSATIAFSPQMGHLHPGCAKDIVVTMKSDVPINLKNMRIR
CKLSRIMFQLPADQVPDWDDRMHTVKWVDVPRNMPGTFTTKRKVIETDPEPAHSVLEENYQE
LQLQISANVDFASYHCQARDVRFKETLVYQTRVFEFDVINSGRVQLEFSWVSEDTSKAVSFA
KPDHQGSAQKDQLSQGTMHTGSTLDSTMDHWAEGSPQPFSVEPSSGIVPVGKIQKFKVKFSP
LDIGDFESNLFCQIPNLPPGEQGPVLVAKGRSTLPICHFDLKDSDYISGHQRNPELRGSSGG
ALDPNTRVIEFTTVGIGGKNLRTFTILNPTNSTYSFCWISEIVFQFTPFHLGITESSWTFLI
PEHNITIVFQFTPFHLGITESSWTFLIPEHNITVPFLLVGKTTEPLISLNKSHLNFSSLLIG
REARETVQIINKEEQGFDFSFQDNSRYSEGFSNSLLVCPMEGWIPPLSRFPIDIFFTPKQEG
DVNFNLICNVEKKVHPVTLNVKAEGYTMNVEIKCKDRTGSITLLTPNQTNIINFYEVELNEC
VQCEFNFINTGKFTFSFQAQLCGSKTLLQYLEFSPIDSTVDVGQSVHATLSFQPLKKCVLTD
LELIIKISHGPTFMCNISGCAVSPAIHFSFTSYNFGTCFIYQAGMPPYKQTLVITNKEETPM
SIDCLYTNTTHLEVNSRVDVVKPGNTLEIPITFYPRESINYQELIPFEINGLSQQTVEIKGK
GTKMKILVLDPANRIVKLGAVLPGQVVKRTVSIMNNSLAQLTFNQSILFTIPELQEPKVLTL
APFHNITLKPKEVCKLEVIFAPKKRVPPFSEEVFMECMGLLRPLFLLSGCCQALEISLDQEH
IPFGPVVYQTQATRRILMMNTGDVGARFKWDIKKFEPHFSISPEEGYITSGMEVSFEVTYHP
TEVGKESLCKNILCYIQGGSPLSLTLSGVCVGPPAVKEVVNFTCQVRSKHTQTILLSNRTNQ
TWNLHPIFEGEHWEGPEFITLEAHQQNKPYEITYRPRTMNLENRKHQGTLFFPLPDGTGWLY
ALHGTSELPKAVANIYREVPCKTPYTELLPITNWLNKPQRFRVIVEILKPEKPDLSITMKGL
DYIDVLSGSKKDYKLNFFSHKEGTYAAKVIFRNEVTNEFLYYNVSPRVIPSGIIKTIEMVTP
VRQVASASIKLENPLPYSVTFSTECRMPDIALPSQFVVPANSEGTFSFEFQPLKAGETFGRL
TLHNTDLGYYQYELYLKATPALPEKPVHFQTVLGSSQIILVKFINYTRQRTEYYCRTDCTDF
HAEKLINAAPGGQGGTEASVEVLFEPSHLGETKGILILSSLAGGEYIIPLFGMALPPKPQGP
FSIRAGYSIIIPFKNVFYHMVTFSIIVDNPAFTIRAGESVRPKKINNITVSFEGNPSGSKTP
ITTKLTVSCPPGEGSETGVKWVYYLKGITL

Figure 6B

Murine Hydin cDNA(SEQ ID NO:16)

aacaagatggactcggcagtgcagcaaaaagtggcgcgcaaaaagtgcagagacttcttccc
taggaaaatggatggcaggtcccatgcccttccttcagctgttcctgccccgttctcaaaat
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tatgcgaccctgaagcaagactgcaacagttaaccgcctctgtgcctctctgtgagcaaaga
aaatatttcaaacagacaaataaaaggctagaggagtccatgggggccatgcatccggaagat
ggccaaagtgatctcaggactgcagagcaaagtcttaccacccatgagcccgaaggtggtca
cagaggaggaagtgaaccggatgctgacaccctcagagttcctgaaagagatgtccctcacc
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cctttccgtctgaaatcatattccagaactattctccctgtgaagtctatgaggtgccattg
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Figure 7A

tgatgacttccgccccaaggaaaagcagagcaagaaggaaccggggaaaaagggctctactt
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gacaagatgcagagcacagacagccactccgtagaggaggttggagaggtggagagcaatcc

Figure 7B

agtgagcaaggcaatcgcacgccacctgggcatcgacatttctgcagaaggccgcctggcca
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Figure 7C

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Figure 7D

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Figure 7E

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Figure 7F